

164

Dr. Blaxall's Report on Epidemics of Diphtheria in the Taunton Rural Sanitary District.

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It having been reported to the Local Government Board that diphtheria had appeared in the Taunton Rural Sanitary District, I received instructions to extend my inquiry from the town of Taunton to any of the villages where I might hear of the disease prevailing. Accordingly I visited Bishop's Lydiard, Bishop's Hull, and Bathpool.

Bishop's Lydiard.

The village of Bishop's Lydiard is situated about 5 miles to the north-west of Taunton. It consists of one long street running nearly north and south, intersected towards the southern extremity by a small stream from which the land on either side rises gently.

The stream is subject to flooding, involving the houses in its immediate vicinity. The geological formation is new red sandstone. The drainage is irregular and defective. A sewer formed of butt-ended pipes is laid from the north end of the village to a stone sewer, which is covered in with flat stones, and has its outlet in an open cesspit, situated in a field about 300 or 400 yards from dwellings. A second stone sewer receives the drainage of the southern part of the village, together with the contents of certain privies, and ultimately discharges into the river.

This latter sewer is flushed by the spare water from a neighbouring mill. With the exception of the privies above referred to, excrement disposal is effected by means of cesspit privies.

The water supply of the village is of a dangerous character, being derived mainly from wells more or less exposed to the risk of pollution. A few houses are dependent upon a spring situated by the roadside and exposed to surface washings.

The outbreak of diphtheria in this village was limited to 10 families. It attacked 20 persons and caused three deaths; the number of cases in families varying from one to six. The initial case dates from September 25th, when Mary R., who had been staying for some weeks with her grandfather in the neighbouring village of Halse, returned to her home at Bishop's Lydiard complaining of sore throat, accompanied by a peculiar rash, which, her mother informed me, "went into patches when rubbed"; her vision also was affected. The medical man who attended her did not suspect diphtheria, but the symptoms here noted, together with the fact that this girl's illness was followed on October 9th by a typical case of diphtheria in her younger sister, Florence, aged 11, living in the same house, justify the conclusion that Mary R.'s attack was diphtheria. Florence R. was a regular attendant at the National day school and the Sunday school up to the date of her attack (October 9th) when, being too unwell to go, she was kept at home for that week, but went to the Sunday school on the 15th, and on the following day resumed attendance as usual at the National school.

Confining our remarks henceforth to *primary* attacks in families, case three occurred on October 16th in a little boy, Frank V., who was also a pupil at the National and at the Sunday school, and in attendance there up to the date of his illness. This boy had no sore throat, but the nose, apparently, was the local seat of the disease, being much swollen and giving off offensive discharge. Fluids regurgitated considerably when attempts were made to swallow, and his vision was much affected. The schoolmaster told me that the vision and voices both of Florence R. and Frank V. were affected to such an extent as to interfere with their success at the school examinations on November 20th. Following upon this case was that of a little girl, Bessie S., attacked on October 27th; she lived with her uncle, next door to Mrs. R., the family first invaded, and attended a private school. From this date (October 27th) to November 30th, seven other families were invaded, including four pupils at the National and Sunday school (one or both), two male adults, aged 18 and 21 years, and Mr. T.'s little son.

With the exception of the last-mentioned case, which will be specially referred to, the sufferers lived in various parts of the village, and apparently the only community of circumstance amongst them to which the spread of the disease could be attributed was that of personal intercommunication between infected and healthy.

Seven out of the 10 primary attacks were amongst school children; six of the sufferers going to the same school with Florence R., who, it is presumed, was the centre of infection to the others. The seventh child (Bessie S.) went to a private school, but lived, as already stated, next door to the family first invaded.

In the case of the two adults there was evidence of personal intercommunication with infected families in the village, besides which one of the young men was in the habit of going to Taunton where diphtheria was also prevalent.

With regard to Mr. T.'s little boy, the household consisted of Mr. and Mrs. T., the child in question, his little sister, aged nine, and several servants living in a detached house, about a mile from the village. The little boy was taken ill on November 30th with what was considered a bilious attack. He kept his bed that day, but got up the two following days, and attempted his lessons; he was, however, too drowsy and listless to do anything. On December 4th he complained of headache and sore throat, and on the night of the 6th he awoke two or three times, saying he was choking. On the following morning the doctor, who was summoned by telegram, pointed out some slight white patches on the child's throat. The little fellow recovered without any symptoms of paralysis, and the case was returned as "diphtheritic sore throat." Two of the servants afterwards suffered from simple sore throat lasting only one day. Mrs. T. informed me that she was not aware of any direct exposure to infection in the case of her little boy, but that workmen from the village were employed on the premises. Further, it transpired that the little girl's riding habit was sent home on the 27th November direct from the tailor's, where diphtheria was present; also, that a plumber, in whose family six cases of diphtheria occurred, was at work in the house shortly before the child's illness. Thus it is shown there was suspicious connexion of one kind or another between Mr. T.'s household and previously infected families.

The facts here stated justify the conclusion that the disease was introduced into Bishop's Lydiard by Mary R. from Halse, and was subsequently spread in the village, chiefly amongst school children, by personal intercommunication between the infected and healthy.

Bishop's Hull.

The village of Bishop's Hull is about $1\frac{1}{2}$ mile to the West of Taunton. It stands on a hill sloping on the north to the river Tone.

The geological formation is new red sandstone till it joins the alluvium in the neighbourhood of the river.

The village is unprovided with drainage. The privies are of a most unwholesome description, discharging into large open cesspits, many of which had not been cleared out for periods varying from one to four or five years. Many of the privies were in a very dilapidated, dirty, and neglected condition, the school privy offering one of the worst examples of the kind. The privy-pit is situated within 4 or 5 feet of the infants' schoolroom, while a wall from the door of the privy to the schoolroom window acts as a funnel for the conveyance of the air of the privy into the room which was perceptibly pervaded by the stink. The door of the privy was broken, and the seats in a bad state of repair.

The villagers are dependent for their water supply upon wells. The water is complained of as being polluted.

With regard to the outbreak of diphtheria in this village, the facts that came to light were as follows:—

Two families named R . . . , closely related to each other, residing in separate houses in New Terrace, on the road between Taunton and Bishop's Hull, were invaded with diphtheria on or about November 18th; the disease attacking two children in one family and one child in the other. Beyond the fact that these children went to school at Taunton, where diphtheria was prevalent, and that free intercourse of one kind and another existed with that town, there was no clue forthcoming as to the origin of these cases.

From the R . . . s the disease spread to the P . . . s, who lived next door to one of the infected families. The P . . . s family consisted of husband, wife, and eight children, three of whom, viz., Alice, Ellen, and Edmund, went to the Bishop's Hull school (about a mile from their own home), Alice being pupil-teacher there. Several of



the P . . . family, including these three children, suffered from sore throat of a specific character, their voices in some instances being affected, but they were not considered ill enough to have a doctor. On November 23rd Edmund returned home from school feeling so ill that he ceased attendance, but his sisters, though suffering from sore throat, continued to go to school as usual.

Following upon this boy's illness, from the 23rd November to the 8th December, seven of the school children were attacked with typical diphtheria and five with sore throats of a suspicious character, three out of the 12 cases proving fatal.

In consequence of this serious outbreak amongst the children the school was closed, with the result that further spread of the disease was arrested.

In all, excluding the initial cases in the R . . . families, 12 families were invaded, with about 20 cases and three deaths.

The infected families lived a distance apart, some in the village, others in hamlets a mile or two off, and inquiry failed to reveal the existence of any community of circumstance that would account for the spread of the disease save attendance at the school. The inference is, that diphtheria was introduced into the school by the P . . . s, who contracted the disease from the R . . . s.

It is highly probable that if this inquiry had been delayed the manner of introduction of the disease would have escaped detection, seeing that the P . . . s did not consult a doctor, and no one in the village seemed to know of their illness until the infected school children were questioned for sore throat in any of their school fellows.

Bathpool.

The recent outbreak of diphtheria at Bathpool and its neighbourhood was limited to four families. There were some 15 cases and two deaths.

The present inquiry was made chiefly in consequence of a representation from Mr. R. to the Local Government Board, to the effect that his house had been invaded by diphtheria two successive years, and he ascribed the origin of the disease to the water supply.

Mr. R. resides at the water mill at Bathpool. His house occupies a damp situation, surrounded by water. The rooms are low, the floors somewhat worm-eaten, and the appearance of some of the walls indicative of dampness. The drainage of the house and the contents of the closets pass away immediately by the mill stream.

The water supply was originally derived from a well in the yard, but being found impure, the well was closed in 1881. The source of pollution was considered to be the river, which receives the effluent sewage from the Taunton sewage tank, about a mile distant. Afterwards the water was obtained from a second well on the premises, but this again was found to be polluted, and the use of the water was in consequence discontinued, when recourse was had to a well at some distance off. The family are supplied with milk from their own cows.

Mr. R.'s household consists of himself, his wife, six children, and a servant.

The first outbreak of diphtheria in this family occurred in September 1881. At that time two of the sons attended at the Wesleyan College, and a third boy went to a kindergarten school; the remainder of the family were generally at home. The disease attacked first, and within a few days of each other, the two boys, who had been regular attendants at the Wesleyan College up to the dates of their respective attacks; and next, at an interval of three or four days, two other of the brothers. All four cases appear to have presented typical symptoms, and during convalescence the boys' voices were much affected. The health of one of the boys in particular suffered considerably from the attack, and he continued very subject to sore throat; but from this time no fresh case of diphtheria appeared until the following September 1882.

The governess was now attacked, and she was at once sent to the sanitary hospital at Taunton. Prior to her illness she was in the habit of visiting the infected town of Taunton, but beyond this I could not learn any particulars respecting her movements there. On her discharge from the hospital she went to Minehead, where the R. family were staying, but, as a matter of precaution, to different lodgings. At the end of a week or so she returned with the family to Bathpool, and shortly afterwards one of the younger boys, who escaped on the former occasion, was attacked, and also the servant, while three of the other boys apparently suffered from the disease a second time.

The history of these outbreaks points to introduction of the disease from without rather than to home origin.

Thus, on the former occasion (September 1881), the disease attacked first the two boys who daily attended the Wesleyan College, to the exclusion of the more numerous

members of the family who were generally at home. And while I am not in a position to determine in what way these boys were exposed to infection, still it is noteworthy that diphtheria at the time was epidemic at Corfe, and present also at the village of Trull, not far removed from the college.

Again, on the recent occasion (September 1882), the governess, who was in the habit of frequenting Taunton, where diphtheria was prevalent throughout the town, was the individual attacked, and during her isolation at the hospital, and subsequently at Minehead, no other case occurred; but on her return to Bathpool diphtheria re-appeared, attacking several of the family and afterwards spreading to other parts of the village.

In all the subsequent cases at Bathpool in 1882 there was evidence of connexion either direct or indirect with this infected family. Thus, on November 25th, Bessie H. was attacked, and died on December 4th. Her father worked at the mill, and the little girl went daily to the house. The occupants of the other cottages in the immediate vicinity, consisting of children and adults, had no connexion with Mr. R.'s house, and escaped.

On or about January the 4th the disease broke out in another part of the village, in the families of Mrs. C. and Mrs. W., living next door to each other, whilst suspicious cases of sore throat occurred in two other families in the same yard. Mrs. C.'s husband was employed at the mill, and her children went occasionally to Mr. R.'s house. There was also another possible channel of infection in this instance, in the shape of some clothes belonging to the little girl, Bessie H. (who died on the 4th December), and which were sent shortly after the child's death to Mrs. C., and Mrs. W. ascribed the outbreak to infection conveyed in these clothes. I could not ascertain the precise date of the clothes being sent, but it was said to be shortly before the occurrence of the cases. In any case this circumstance, together with the fact that Mrs. C.'s children did occasionally go to Mrs. R.'s house, establishes the existence of communication with previously infected families, and offers a probable explanation of the appearance of diphtheria in this yard.

The sanitary conditions of Bathpool offer no exception to other parts of the rural district visited by me. Cesspit privies of the worst type are general, and the water supply is derived from wells which are greatly exposed to pollution. I went to Bathpool on two occasions. The first time I found that the privy and water supply belonging to the row of cottages in which Mrs. H. resided had been condemned, and the people were obliged to get their drinking water from wherever it could be obtained. On my second visit I found a new privy had been built, having a cesspit about 4 feet square and 4 feet deep, thereby providing for a large accumulation of excrement in a decomposing state, and so perpetuating nuisance with risk to health. The well, which stands in close relation to the privies, had professedly been cleansed, and the people were again allowed the use of it, but they complained to me that the water was not fit to drink, producing a sample of it, which was thick and discoloured, and, to me, had an unpleasant odour.

The excremental nuisances detailed in this Report as met with in the several villages are no doubt inseparable from the method of excrement disposal that is employed in this rural district; but they also gave evidence of the want of frequent and systematic supervision by the Inspector of Nuisances. Mr. Richmond, the Inspector, holds the appointment also of road surveyor, and this, in my opinion, militates against an efficient performance of his sanitary duties, for the district covers an area of 68,282 acres, and contains a population of 19,362 persons. To keep it free from nuisance and conditions injurious to health would require an officer's whole time; and it will be desirable that such change should be made in the tenure of the Inspector's office as will secure the undivided services of a competent person as Inspector.

June 1883.

F. H. BLAXALL.

RECOMMENDATIONS.

(1.) It is highly important that a wholesome method of excrement removal and disposal should be introduced and the existing privy pits abolished. The dry-earth principle would probably be found well adapted to meet the requirements of the district. The Authority may usefully consult the Office Report on "Certain means of preventing excrement nuisances in towns and villages." To insure the privies being kept in a wholesome condition they should be systematically supervised under direction of the Sanitary Authority.

(2.) Steps should be taken to secure to the people a plentiful and wholesome supply of water which, where practicable, should be brought into the villages from extraneous sources. No privy pit, dung-heap, pig-sty, or other source of pollution should be permitted in the near vicinity of wells or other sources of supply.

(3.) All populous parts of the district should be provided with proper sewers, or other channels for the removal of slop and waste water (Public Health Act, 1875, sections 15, 19, 23). Care must be taken to dispose of the sewage in such a manner as not to be productive of nuisance.

(4.) The Authority should require the Inspector of Nuisances to devote the whole of his time to the performance of his duties, and to make such inspections of the district as are required by section 92 of the Public Health Act.
